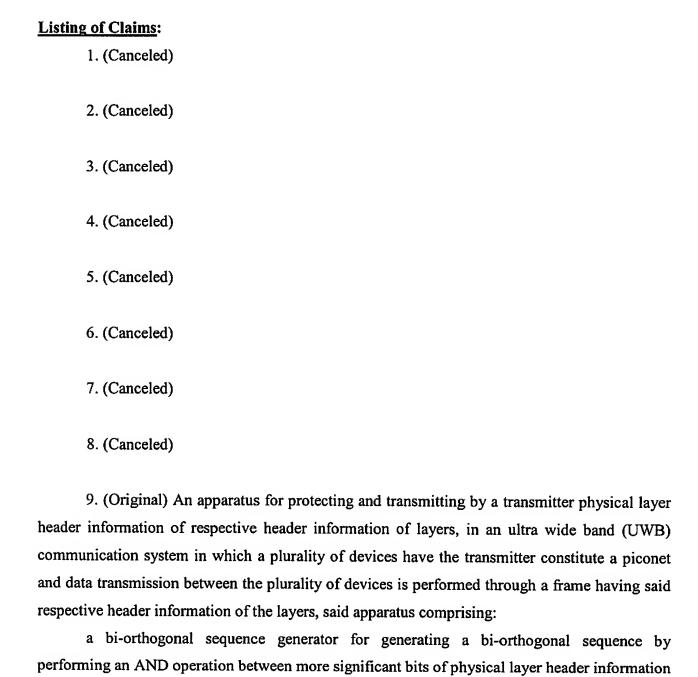
## Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:



bits and predetermined basis Walsh code sequences;

a mask sequence generator for generating a mask sequence by performing an AND operation between less significant bits of the physical layer header information bits and predetermined mask sequences; and

an exclusive OR element for performing an exclusive OR operation on a symbol-bysymbol basis between the bi-orthogonal sequence output from the bi-orthogonal sequence generator and the mask sequence output from the mask sequence generator, so as to output a single encoded symbol sequence.

- 10. (Original) The apparatus according to claim 9, wherein the physical layer header information bits are 11 bits in length.
- 11. (Original) The apparatus according to claim 10, wherein the physical layer header information bits include information of a MAC frame's transfer rate and information of a payload length.
- 12. (Original) The apparatus according to claim 9, wherein the bi-orthogonal sequence generator comprises:
  - a bit "1" generator for generating a sequence of 1s;
- a basis Walsh code generator for generating 5 basis Walsh code sequences of length 32; and
- a plurality of AND elements for receiving all 11 bits of the physical layer header information as their inputs, performing respective AND operations between 5 more significant bits of the 11 bits and the 5 basis Walsh code sequences, and performing an AND operation between a sixth bit of the 11 bits and the sequence of 1s.
- 13. (Original) The apparatus according to claim 9, wherein the mask sequence generator comprises:
- a basis mask sequence generator for generating 5 basis mask sequences of length 32; and a plurality of AND elements for receiving all 11 bits of the physical layer header information as their inputs, and performing respective AND operations between 5 less significant bits of the 11 bits and the 5 basis mask sequences.

- 14. (Original) A method for protecting and transmitting by a transmitter physical layer header information, of respective header information of layers, in an ultra wide band (UWB) communication system in which a plurality of devices have the transmitter constitute a piconet and data transmission between the plurality of devices is performed through a frame having said respective header information of the layers, said method comprising the steps of:
- a) generating a bi-orthogonal sequence by performing an AND operation between more significant bits of physical layer header information bits and predetermined basis Walsh code sequences;
- b) generating a mask sequence by performing an AND operation between less significant bits of the physical layer header information bits and predetermined mask sequences;
- c) performing an exclusive OR operation on a symbol-by-symbol basis between the generated bi-orthogonal sequence and the generated mask sequence, and
  - d) outputting a single encoded symbol sequence.
- 15. (Original) The method according to claim 14, wherein the physical layer header information bits are 11 bits in length.
- 16. (Original) The method according to claim 15, wherein the physical layer header information bits include information of a MAC frame's transfer rate and information of a payload length.
- 17. (Original) The method according to claim 14, wherein said step a) comprises the steps of:
  - a-1) generating a sequence of 1s;
  - a-2) generating 5 basis Walsh code sequences of length 32;
  - a-3) receiving, as inputs, all 11 bits of the physical layer header information;
- a-4) performing respective AND operations between 5 more significant bits of the 11 bits and the 5 basis Walsh code sequences; and
- a-5) performing an AND operation between a sixth bit of the 11 bits and the sequence of 1s.

- 18. (Original) The method according to claim 14, wherein said step b) comprises the steps of:
  - b-1) generating 5 basis mask sequences of length 32;
  - b-2) receiving, as inputs, all 11 bits of the physical layer header information; and
- b-3) performing respective AND operations between 5 less significant bits of the 11 bits and the 5 basis mask sequences.